MISA UPDATE

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Kraft mill pollution reduction strategy implemented

Ontario's nine kraft mills must reduce the flow of toxic chemicals currently being discharged into the province's rivers and lakes by the end of 1991, as the result of a program announced in April by Environment Minister, Jim Bradley. The ministry has also alerted these mills that subsequent discharge limits, imposed under the MISA program, will require further pollution reductions.

The nine kraft mills operating in Ontario discharge nearly a million cubic metres of effluent each day – a volume equal to the sewage produced by a population of two million people.

These mills are distinct from others in the pulp and paper sector by their use of chlorine to bleach the pulp. In the process the chlorine combines with the dissolved organic matter from wood fibres, and can form persistent and acutely toxic compounds that bioaccumulate and bioconcentrate.

It is estimated that mills currently discharge 150 to 200 tonnes of these chlorinated compounds each day. As well, the effluents from eight of nine mills have been found to be acutely toxic to fish. Studies have shown that five of the seven mills surveyed had traces of the most toxic form of dioxins – 2,3,7,8-TCDD.

To reduce this level of pollution, the ministry has developed a control strategy calling for immediate abatement between now and 1991 followed by more comprehensive pollution control measures under MISA between 1991 and 1993. This strategy was developed after careful consideration of a study on kraft mill operations conducted by an independent body of experts.

Immediate abatement action

Based on the experts' findings that proven and practical technology exists, the ministry will seek the maximum pollution reductions that can be attained from each mill over the next two years. Plans are underway for control orders to be issued in the fall of 1989 requiring mills to reduce their discharge of chlorinated organic compounds to no more than 2.5 kilogram per air dried tonne of kraft pulp.

In addition, mills will be required to reduce, immediately after the orders become enforceable, biochemical oxygen demand (BOD) and suspended solid discharges.

The mills will also be required to monitor their effluents and report to the ministry during this two year control period.

Controls under MISA

While these interim controls will immediately reduce discharges, significantly lower limits are being developed under the MISA program.

Under MISA, kraft mills will be required to meet discharge limits attainable using the best available technology economically achievable (BATEA). As well, mill effluent must be non-lethal to fish.

The ministry will develop BATEA limits with the participation of the joint technical committee for the pulp and paper sector and the MISA advisory committee of independent environmental specialists. Together, they will review the data gathered during the 12-month monitoring program that all pulp and paper mills will begin in January 1990. The results from ministry studies of chlorinated organic compounds will also be considered.

The BATEA limits that are determined will then be disseminated for public review. Subsequently, a limits regulation will be promulgated in 1991. Mills must be in compliance with the regulation by 1993.

Under both the regulation and the interim controls, kraft mills will be free to choose how they achieve their discharge limits. The options include manufacturing process changes, substitution of chemicals, recycling of waste byproducts, and end-of-pipe treatment. The experts committee identified four pollution abatement technologies which are proven, practicable and economically achievable.

The first, a process change called oxygen delignification, uses oxygen to remove organic matter, thus reducing the amount of chlorine required. A second process, known as high chlorine substitution, replaces chlorine with chlorine dioxide, resulting in a less toxic waste byproduct.

A third process change – extended delignification – provides more 'cooking' time for the wood chips. This again removes more organic matter so less chlorine bleaching is required later in the process. Finally, the experts identified biological treatment as an end-of-pipe approach. The organic material in the effluent can be converted by biological treatment into water, carbon dioxide and organic sediments.

The first three options offer opportunities for increased production efficiency and reducing the volume of toxic waste. The ministry encourages kraft mills to move in this direction.

Economic considerations

Economic factors were considered during the development of the pollution reduction strategy for this industry. The ministry assessed the impact of the requirements it will be establishing and has determined that Ontario's kraft mills can achieve the limits called for, in most cases, without financial difficulty.

Included in the ministry's consideration was the important economic contribution made by the pulp and paper industry in smaller towns. The livelihoods of many of these towns depends on the existence of a kraft mill.

The ministry also took into account that Ontario's mills

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Kraft mills, such as the one pictured above, must reduce their toxic and conventional contaminants as a result of MOE's recently announced pollution reduction strategy

STOPPING WATER POLLUTION AT ITS SOURCE

MISA
Municipal/Industrial Strategy for Abatement

IN THIS ISSUE

INSIGHT

MISA reaches turning point

by Jim Bradley
Minister of the Environment

The Municipal Industrial Strategy for Abatement has reached a major turning point with two recent events.

With the release of the monitoring regulations for the petroleum refining, organic chemical manufacturing, iron and steel, inorganic chemicals, pulp and paper and mining sectors, MISA has passed beyond strategy development and planning and entered into its true purpose as an action program to reduce pollution.

The Ministry of the Environment has a mandate to ensure that MISA is implemented, that it is enforced, and that it produces the results for which it was designed.

Ministry funding for the MISA program has been increased by $8.3 million to a new total of $20.9 million this year and program staff will increase by 77 to 244.

Under MISA, industries will no longer be able to avoid their responsibility for the toxic contaminants they discharge into Ontario's waterways. The true cost of handling, treating or eliminating those wastes are being directed back to the source of the problem instead of being imposed on the community at large.

The first fruit of the MISA approach is the petroleum refining sector monitoring regulation which was issued in the summer of 1988. The monitoring requirements for petroleum refineries will be completed by the end of 1989. Three other sectors, organic chemical manufacturing, iron and steel and inorganic chemicals will begin monitoring later this year. The remaining sectors will begin monitoring in 1990.

Jim Bradley,
Minister of the Environment

While MISA is good news for the environment, it is both an immediate opportunity and a long-term insurance policy for industry. In some sectors, the cleanup required by MISA provides opportunities for forward-looking enterprises to improve productivity as waste production is cut, and to create marketable clean new processes. Meanwhile, MISA safeguards clean water, the very basis of civilization and industrial development.

The discussion paper released last fall, *Controlling Industrial Discharges to Sewers* outlines the direction the ministry will be taking in cleaning up the thousands of industrial discharges now being discharged into the municipal sewer systems.

This discussion paper presents a clear sense of direction for municipalities. To provide an interim measure of control, we have released the model sewer use by-law, a tool which they can use to start developing action and abatement programs in their own communities. There is nothing to prevent a municipality from starting now to establish the information base and organization which MISA's municipal strategy will require of them.

The end result, from action at the municipal and provincial levels, will be a healthier, cleaner environment with a more equitable distribution of the costs this cleanup entails.

Iron and steel sector monitoring regulation promulgated

Ontario's seven iron and steel producers must monitor the wastewaters they discharge to rivers and lakes for up to 152 contaminants.

These seven plants are located along lake Ontario between Hamilton Harbour and Whitby, along the St. Mary's river, along the Ottawa River, in the Niagara area and along Lake Erie near Nanticoke.

The effluent monitoring regulation for the iron and steel sector was promulgated on the 29th of May, following a public review period.

Companies in this sector have five months to comply with the regulation. Monitoring is to begin November 1, 1989. This lead-in time will allow the companies to purchase and install required equipment to arrange for laboratory services and to train personnel.

The monitoring approach

For the purpose of monitoring, the iron and steel industry was divided into integrated iron and steel mills (four plants), specialty steel producers and mini mills (three plants). Integrated mills include coke-making and iron-making processes which generate most of the industry's priority pollutants. Specialty steel producers and mini mills generally melt scrap metal to produce low carbon steel and specialty steel products.

Final discharges to waterways will be monitored daily for four contaminants, three times a week for 12 contaminants, weekly for eight to 12 contaminants, monthly for 86 (the three smaller operations) or 117 contaminants (for the four large mills), and quarterly for 140 (small mills) or 152 pollutants (large mills). Other waste streams such as cooling water, waste disposal site and storage site will also be monitored. Biological monitoring will provide an additional screening mechanism that will complement chemical analysis of toxic substances. Monthly effluent toxicity tests using rainbow trout and Daphnia magna will be conducted.

Effluent samples taken from each plant will be analysed in accordance with quality assurance/quality control standards specified in the regulation. The ministry will audit the sampling and analysis to assure the results are accurate and representative.

Economic considerations

The ministry has produced a report which assesses the economic environment of the iron and steel sector and analyses the financial implications of the monitoring costs.

The report is entitled *Economic Implications of the MISA Monitoring Regulations on Ontario's Iron and Steel Sector: Final Report*. Highlights of the report are summarised below.

- About 34,000 people are employed by the iron and steel sector companies.
- Cost of monitoring will be borne by the industry.
- Incremental capital and monitoring costs for the iron and steel sector will be about $8.4 million ($3.3 million for operating costs and $5.1 million for capital costs).
- The monitoring requirements will not have an adverse effect on employment levels.
- Plants will not suffer undue financial burden from the monitoring costs.

MAC plays vital role in MISA program

The MISA Advisory Committee (MAC) of independent environmental experts has been involved with the MISA program ever since it was established by an Order-in-Council, in November 1986.

Committee members were appointed to MAC by the Minister of the Environment on the basis of their knowledge, concern and expertise in environmental issues.

The group has met 48 times since November, 1986 to review and advise on the progress of the MISA program and the adequacy of the draft regulations.

MAC has also reviewed and commented on the *Kraft Mill Effluents* in Ontario report which was the basis for the recently announced strategy for kraft mill pollution reduction.

MAC has also provided comments on the discussion paper *Controlling Industrial Discharges to Sewers*, and will actively participate in developing the MISA municipal regulations and sewer use control program.

Two new members, Joanna Kidd (formerly of Pollution Probe) and Paul Muldoon (Canadian Institute for Environmental Law and Policy), were recently appointed to the committee. James MacLaren (consulting engineer) is the chairperson. Dr. Isobel Heathcote (University of Toronto) and Kai Millyard (Friends of the Earth) were recently appointed vice-chairpersons.

Harvey Clare (industrial executive), Dr. Paul Hebert (University of Windsor), and Dr. Don Mackay (University of Toronto) complete the membership.

The MAC annual report is available to interested parties on request.

For more information please call Doug Vallery, the co-ordinator of MAC, at 965-1400.

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operate in a cyclical economic climate. The market for bleached kraft pulp is currently strong, and this is a good time to make financial commitments to pollution reduction.

Compliance costs will vary considerably from mill to mill. Costs to meet the proposed requirements depend on the type of technology employed by the mill, and past efforts and investments made to improve effluent quality. Those mills that have made little or no effort in the past will face higher costs.

In most cases, as indicated by the experts committee, capital expenditure on pollution reduction through process change can be at least partially recovered through resulting savings in operating costs.

Enforcement

The pulp and paper sector effluent limits regulation, as with all sectors under MISA, will be issued under Section 136 of the *Environmental Protection Act*. Penalties for non-compliance can be severe.

Convicted violators of regulations and orders made under the Act face fines of up to $50,000 for corporations and $5,000 for individuals per day for each offence on first conviction. For a subsequent conviction, a corporation can be fined $100,000 per day and individuals can be fined $15,000 per day.

In cases where damage to the environment is caused, corporations face fines on first conviction of up to $250,000 per day for each offence and on a subsequent conviction of up to $500,000 per day. Individuals, for a first conviction, face fines of up to $10,000 per day with a fine of up to $25,000 per day for a subsequent conviction for each offence, plus a year in jail.

Directors and officers of a corporation are liable for the activities of their corporation that may result in damage to the environment.

MOE reviewing public comments on sewer use control

In September 1988, the Ministry of the Environment released a discussion paper that outlined a program to reduce the toxic discharges from thousands of industries to municipal sewer systems. A public review period on the discussion paper entitled *Controlling Industrial Discharges to Sewers* has been completed. The ministry is now considering public comments and developing its final position.

Responses to the discussion paper generally support the ministry's position to impose controls at the source. Some concerns were raised regarding the enforcement and costs of the program.

As part of the review process, the ministry conducted 15 workshops across the province. These workshops provided an opportunity for municipal, industrial and business representatives to examine the proposed program in detail with ministry staff. In addition, written submissions were received from the MISA advisory committee, environmental interest groups, industrial companies, industrial associations, business associations and other government agencies. The ministry will publish a report containing the public's comments and suggestions, and the ministry's response to them.

MISA sewer use control program

The proposed program calls for thousands of industries to reduce drastically toxic contaminants from their liquid wastes before discharging to municipal sewer systems. This would complement the MISA direct discharge component.

The ministry proposes a sewer use control program that will implement discharge limits regulations on 22 industrial sectors across the province. To meet these limits, industries must reduce their toxic discharges to levels that can be obtained using the best available technology that is economically achievable (BATEA). Industries will be free to choose how they meet the discharge limits. For example, they may wish to reduce or recycle their toxic wastes, change production processes, substitute raw materials or use pre-treatment technology.

Industries not covered under an industrial sector BATEA discharge limit, and industries which discharge significant quantities of conventional pollutants, would have to meet local limits designed to protect the receiving environment or the treatment process of the local sewage treatment plant.

Enforcement of these discharge limits will be shared by the ministry and the municipalities. As the first line of enforcement, municipalities will be responsible for developing and implementing a sewer use control plan that incorporates all the provincial requirements including enforcement. The plan will be subject to ministry approval. Once the plan is approved and implemented, the ministry will continue to audit industries' compliance with the discharge limits and the municipalities' enforcement of the program. Both industries and municipalities could be subject to prosecution if discharge limits are exceeded.

Currently, each municipality is responsible for developing and enforcing its own sewer use by-laws. Under the existing system requirements vary from municipality to municipality, but even the most stringent ones fail to adequately control the discharge of toxic contaminants.

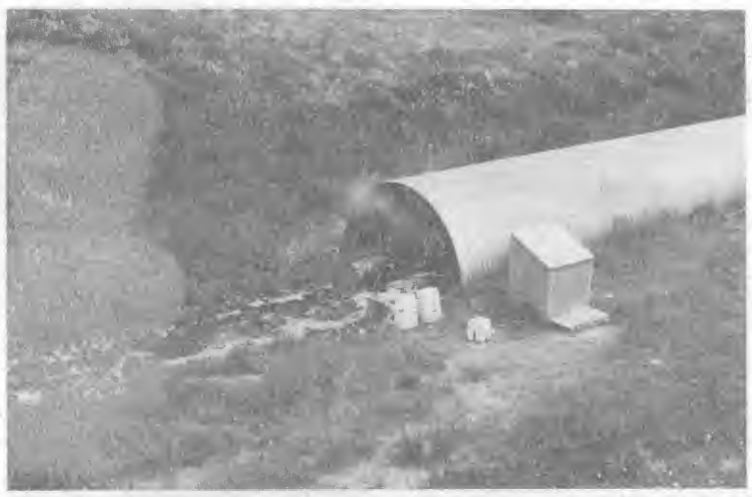
Sewage treatment plants are not designed to treat these contaminants. As a result, some toxic pollutants, unless they are prevented from entering the sewer system, will continue to pass through into the natural waterways, contaminate sewage sludge, threaten sewage treatment plant workers' health and interfere with the sewage treatment plant operations.

Under the MISA program, discharge limits will be placed on effluent from sewage treatment plants. It will be the responsibility of sewage treatment plant owners to ensure the limits are met. The development and enforcement of the ministry's sewer use control program will help sewage treatment plants meet the MISA discharge limits.

As an interim measure, while the sewer use program is being developed and implemented, ministry staff have been working with municipalities to strengthen existing sewer use by-laws and gather data on industries using their sewer systems.

Training courses have been prepared for those who will be involved in the monitoring and enforcement of the program. They will be offered at community colleges starting in the fall of 1989.

A two-day workshop will also be held at the University of Toronto's Institute for Environmental Studies in September.



Monitoring of effluent will be required under the interim control program for kraft mills, and also by the MISA monitoring regulation for the pulp and paper sector. A kraft mill discharge pipe, above, is being monitored for flow rates.

September symposium planned on MISA and the municipalities

The University of Toronto's Institute for Environmental Studies will be holding a two-day symposium, September 11-12 in Toronto, on the role of the municipalities in implementing the MISA municipal regulation and sewer use control program.

The symposium will assist elected officials and municipal staff to understand the requirements of MISA and the role they will play in implementing and enforcing sewer use control by-laws.

The registration fee for the conference will be $295

For more information please write Dr. Marianne B. Scott, MCC Systems Canada Inc., 30 Wellington Street East, Suite #202, Toronto, Ontario M5E 1S3 or call 416-368-2959

UPCOMING MISA EVENTS

AUGUST 1989

- Promulgation of the effluent monitoring regulation for the mining sector.
- Release of the draft effluent monitoring regulation for the electric power generation sector. There will be a 30-day public review period.

A copy of the draft regulation may be obtained from Environment Ontario's Public Information Centre at 416-323-4321.

SEPTEMBER 1989

- Release of the draft effluent monitoring regulation for the industrial mineral sector. There will be a 30-day public review period.

A copy of the draft regulation may be obtained from the Public Information Centre at 416-323-4321.

- Promulgation of the effluent monitoring regulation for the metal casting direct discharge sector.
- September 11-12, 1989–'The Municipalities' Role in MISA: A Two-Day Symposium on the Municipal-Industrial Strategy for Abatement of Pollutants in Ontario's Waterways', the Skyline Hotel, Toronto. Sponsored by the University of Toronto's Institute for Environmental Studies and Environment Ontario. Registration fee $295. For more information call Marianne Scott, 416-368-2959.
- September 17-22, 1989 – 'Dioxin '89 - 9th International Symposium on Chlorinated Dioxins and Related Compounds'. Chlorinated dioxins, dibenzofurans and other related organics continue to remain in the forefront of public, scientific and regulatory interest. The symposium will allow scientists to exchange the latest technical advances with their peers. Environment Ontario is a sponsor. The symposium will be held at the Hilton International Hotel, Toronto, Ontario. Full registration $500 after June 5, 1989. For more information call 416-860-1772.

OCTOBER 1989

- Promulgation of the effluent monitoring regulation for the electric power generation sector
- Promulgation of the effluent monitoring regulation for the industrial mineral sector

SECTOR UPDATES

Each of the nine industrial sectors and the municipal sector pass through three main stages in the MISA program. First, the Ministry of the Environment consults with sector companies, the MISA advisory committee and the public to formulate a comprehensive monitoring regulation. Second, each sector must comply with the monitoring regulation; and third, an abatement regulation is implemented.

Monitoring regulations for five of the sectors have been developed and passed into law. Within the next few months monitoring regulations for another four sectors will also be promulgated. The municipal sewage treatment plant sector monitoring regulation will become law in early 1990.

The petroleum refining monitoring regulation was implemented in July, 1988. The monitoring regulations for the organic chemical manufacturing (OCM), iron and steel, and inorganic chemicals have been developed over the past several months. They are reviewed in this issue. The pulp and paper and mining sector regulations were promulgated in late July and August respectively, and could not be reviewed in this issue. A summary of the pulp and paper and mining regulation will be included in the next issue of the *MISA Update*.

Brief summaries of the progress made to date in all other sectors are also provided. Detailed reviews will be provided for all monitoring regulations when they are promulgated.

OCM monitoring regulation becomes law

The monitoring regulation for the organic chemical manufacturing sector became law on April 25, 1989. This regulation, the second to be promulgated under the MISA program, requires 19 organic chemical manufacturing plants to report the quantity and quality of their discharges for a period of 12 months. The information attained through monitoring will then be used to set discharge limits.

With the promulgation of the regulation, OCM companies are preparing their plants for monitoring which is to begin on October 1, 1989. The five-month implementation period is being used by plants for purchasing and putting into place the sampling and flow measurement equipment, securing necessary laboratory services and hiring and training any additional staff.

Currently, little information is available on toxic contaminants discharged by OCM plants. Short-term studies have indicated that, along with conventional pollutants, a wide variety of toxic contaminants such as metals, phenols and hydrocarbons are present. A complete list of what specific compounds are being discharged, or in what concentrations, is not yet available.

The monitoring approach

The first step taken to address this inadequacy has been the development of the monitoring regulation. Here the most significant challenge was the wide diversity within the OCM industrial sector.

The diversity of the OCM sector necessitated that separate monitoring schedules be developed for each discharge stream in the sector. Each schedule in the OCM regulation identifies the list of compounds that must be monitored in the specific stream and stipulates how often samples must be collected and analysed.

The missing information will be provided by the monitoring required under the regulation. Plants will be sampling and analysing their effluents on a daily, thrice weekly, monthly and quarterly basis. Their monitoring list consists of a total of 137 compounds.

Providing a schedule tailored to each discharge stream ensures that each effluent is analysed appropriately, and that sufficient and representative monitoring data is gathered in a practical and cost-effective manner.

Monitoring will continue for one year to ensure the data collected reflects all operating conditions for each plant in all seasons. Discharge limits will then be developed based on the monitoring data base and the best available technology economically achievable (BATEA).

The regulation will also require biological monitoring. Toxicity tests will be run on final plant effluents using rainbow trout and another, more sensitive organism, Daphnia magna (water fleas).

Economic considerations

Ministry staff have compiled an economic analysis to complement the OCM sector monitoring regulation. The report is entitled *Ontario's Organic Chemical Manufacturing Sector: Monitoring Cost Estimates*. Highlights of the report are listed below.

- Nineteen plants are regulated under the monitoring regulation – they are located along the St.Clair River; along Lake Ontario between Coburg and Kingston; along the St. Lawrence River between Maitland and Cornwall; in the Niagara area; and north of Orillia.
- These plants, like others across Canada, went through a recession in the early 1980s, but most are currently experiencing record profits.
- Approximately 9,500 people are employed by OCM sector plants that will be monitoring.
- Monitoring will not have an adverse effect on employment levels.
- Incremental monitoring costs for the OCM sector will be about $10.9 million in total – operating costs ($8.1 million) and capital costs ($2.8 million).
- Analysis indicates that the OCM sector plants will not suffer undue financial or economic burden from monitoring costs.

Effluent monitoring regulation for inorganic chemicals sector

The fourth regulation promulgated under MISA – *The Effluent Monitoring Regulation for the Inorganic Chemical Sector* – requires Ontario's 22 inorganic chemicals plants to monitor their wastewater for 153 contaminants.

Plants will monitor process wastewater daily for three to seven conventional pollutants; three times a week for those toxic and conventional pollutants found at significant concentrations during pre-regulation monitoring; weekly for other pollutants known to be present; monthly for all compounds chemically similar to any compounds included in weekly or thrice weekly monitoring; and two to four times a year for the complete sector list of 13 chemicals.

Monthly biological monitoring will also be conducted on plant effluents using rainbow trout and another sensitive organism, Daphnia magna (water fleas).

The monitoring approach

Inorganic chemical industries process and refine naturally occurring raw materials into a wide variety of products including acids, detergents, fertilizers and bleaches. The wastewater generated from these processes contain conventional pollutants and toxics including metals, phenols and organic compounds.

Within this broad description, each plant tends to be unique in terms of size of operations and products produced. As well, current wastewater treatment practices vary from one location to another. About half the plants use lagoons and neutralization basins. Two sites have secondary/tertiary treatment such as carbon absorption systems. The remaining plants discharge their effluent directly to the receiving streams with no treatment.

The monitoring approach developed under the regulation accommodates this diversity. Each effluent pipe in the 22 plants has a specific list of contaminants and monitoring schedule. This will ensure representative data is gained through monitoring in an equitable and cost-effective manner. Monitoring will commence on December 1, 1989 for the twelve-month period.

Economic considerations

The ministry has produced a report which assesses the economic environment of the inorganic chemicals sector and analyses the financial implications of monitoring costs. The report is available under the title: *Monitoring Costs and Their Implications for Direct Dischargers in the Ontario Inorganic Chemicals Industry: Final Report.*

- The 22 plants in the sector are located almost exclusively in southern Ontario and discharge into the Grand, Detroit, St. Clair, St. Lawrence, Niagara and Welland rivers and Hamilton Harbour, Lake Gibson and Lake Nipissing.
- In total, approximately 4,300 people are employed by inorganic chemicals plants subject to MISA monitoring requirements – individual plants employ from 12 to 600 workers.
- The industry exports much of its produce – total world demand for inorganic chemicals is inelastic but the demand for Ontario's product is likely to be price-sensitive.
- Incremental monitoring costs will be about $5.6 million including operating costs ($4.1 million) and capital cost ($1.5 million).
- The sector plants are not expected to be unduly burdened financially from the monitoring costs, nor will the monitoring requirements have an adverse effect on employment levels.

Petroleum refining sector monitoring continues

The petroleum refining sector continues to collect and analyse samples under the terms of a monitoring regulation that was promulgated for this sector in June 1988.

The monitoring regulation came into force on December 1, 1988, and since then over eight months of monitoring data has been collected. Final results of the monitoring program will be available after all the monitoring data has been received, and a comprehensive evaluation of all the data has been completed.

Once the monitoring data has been evaluated by the ministry an effluent limits regulation will be developed for the petroleum refining sector. The regulation will be drafted in consultation with industry through the joint technical committee and with the MISA advisory committee. Members of the public will have an opportunity to review and comment on the draft effluent limits regulation when it is released for public review. The regulation will be in place in 1991.

Monitoring regulations about to be promulgated

Four more direct-discharge industrial sectors – mining, metal casting, electric power and industrial minerals – will come under MISA monitoring regulations this summer or early fall. The mining and metal casting monitoring regulations have completed a public review and will be promulgated in late August.

Another two sectors, electrical power generation and industrial minerals will have draft monitoring regulations released for 30-day public review periods in August and September, respectively. Monitoring regulations for electric power and industrial minerals should become law in October or November.

With the promulgation of the industrial minerals regulation all nine MISA industrial sectors will have monitoring regulations in place. The monitoring program for the municipal sewage treatment plant sector is under development.

Each sector has been working in a joint technical committee over the past year to develop a draft monitoring regulation. The MISA advisory committee, an independent body of environmental experts, evaluates the draft of the monitoring regulation. Subsequently, the regulations are released in draft form for public review.

Once the public consultation process is complete, a revised draft of the regulation is then passed on to the Registrar of Regulations, and finalized for submission to Cabinet. The monitoring regulations are made available to the public shortly after they are promulgated by Cabinet. Copies may be obtained by calling or writing the Ministry of the Environment's Public Information Centre, 135 St. Clair Ave. West, Toronto, Ontario M4V 1P5, 416-323-4321.

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The diversity of the OCM sector necessitated that separate monitoring schedules be developed for each discharge stream in the sector. Each schedule in the OCM regulation identifies the list of compounds that must be monitored in the specific stream and stipulates how often samples must be collected and analysed.

The missing information will be provided by the monitoring required under the regulation. Plants will be sampling and analysing their effluents on a daily, thrice weekly, monthly and quarterly basis. Their monitoring list consists of a total of 137 compounds.

Providing a schedule tailored to each discharge stream ensures that each effluent is analysed appropriately, and that sufficient and representative monitoring data is gathered in a practical and cost-effective manner.

Monitoring will continue for one year to ensure the data collected reflects all operating conditions for each plant in all seasons. Discharge limits will then be developed based on the monitoring data base and the best available technology economically achievable (BATEA).

The regulation will also require biological monitoring. Toxicity tests will be run on final plant effluents using rainbow trout and another, more sensitive organism, Daphnia magna (water fleas).

Economic considerations

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- Approximately 9,500 people are employed by OCM sector plants that will be monitoring.
- Monitoring will not have an adverse effect on employment levels.
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Within this broad description, each plant tends to be unique in terms of size of operations and products produced. As well, current wastewater treatment practices vary from one location to another. About half the plants use lagoons and neutralization basins. Two sites have secondary/tertiary treatment such as carbon absorption systems. The remaining plants discharge their effluent directly to the receiving streams with no treatment.

The monitoring approach developed under the regulation accommodates this diversity. Each effluent pipe in the 22 plants has a specific list of contaminants and monitoring schedule. This will ensure representative data is gained through monitoring in an equitable and cost-effective manner. Monitoring will commence on December 1, 1989 for the twelve-month period.

Economic considerations

The ministry has produced a report which assesses the economic environment of the inorganic chemicals sector and analyses the financial implications of monitoring costs. The report is available under the title: *Monitoring Costs and Their Implications for Direct Dischargers in the Ontario Inorganic Chemicals Industry: Final Report.*

- The 22 plants in the sector are located almost exclusively in southern Ontario and discharge into the Grand, Detroit, St. Clair, St. Lawrence, Niagara and Welland rivers and Hamilton Harbour, Lake Gibson and Lake Nipissing.
- In total, approximately 4,300 people are employed by inorganic chemicals plants subject to MISA monitoring requirements – individual plants employ from 12 to 600 workers.
- The industry exports much of its produce – total world demand for inorganic chemicals is inelastic but the demand for Ontario's product is likely to be price-sensitive.
- Incremental monitoring costs will be about $5.6 million including operating costs ($4.1 million) and capital cost ($1.5 million).
- The sector plants are not expected to be unduly burdened financially from the monitoring costs, nor will the monitoring requirements have an adverse effect on employment levels.

Petroleum refining sector monitoring continues

The petroleum refining sector continues to collect and analyse samples under the terms of a monitoring regulation that was promulgated for this sector in June 1988.

The monitoring regulation came into force on December 1, 1988, and since then over eight months of monitoring data has been collected. Final results of the monitoring program will be available after all the monitoring data has been received, and a comprehensive evaluation of all the data has been completed.

Once the monitoring data has been evaluated by the ministry an effluent limits regulation will be developed for the petroleum refining sector. The regulation will be drafted in consultation with industry through the joint technical committee and with the MISA advisory committee. Members of the public will have an opportunity to review and comment on the draft effluent limits regulation when it is released for public review. The regulation will be in place in 1991.

Monitoring regulations about to be promulgated

Four more direct-discharge industrial sectors – mining, metal casting, electric power and industrial minerals – will come under MISA monitoring regulations this summer or early fall. The mining and metal casting monitoring regulations have completed a public review and will be promulgated in late August.

Another two sectors, electrical power generation and industrial minerals will have draft monitoring regulations released for 30-day public review periods in August and September, respectively. Monitoring regulations for electric power and industrial minerals should become law in October or November.

With the promulgation of the industrial minerals regulation all nine MISA industrial sectors will have monitoring regulations in place. The monitoring program for the municipal sewage treatment plant sector is under development.

Each sector has been working in a joint technical committee over the past year to develop a draft monitoring regulation. The MISA advisory committee, an independent body of environmental experts, evaluates the draft of the monitoring regulation. Subsequently, the regulations are released in draft form for public review.

Once the public consultation process is complete, a revised draft of the regulation is then passed on to the Registrar of Regulations, and finalized for submission to Cabinet. The monitoring regulations are made available to the public shortly after they are promulgated by Cabinet. Copies may be obtained by calling or writing the Ministry of the Environment's Public Information Centre, 135 St. Clair Ave. West, Toronto, Ontario M4V 1P5, 416-323-4321.

Continued from page 1

operate in a cyclical economic climate. The market for bleached kraft pulp is currently strong, and this is a good time to make financial commitments to pollution reduction.

Compliance costs will vary considerably from mill to mill. Costs to meet the proposed requirements depend on the type of technology employed by the mill, and past efforts and investments made to improve effluent quality. Those mills that have made little or no effort in the past will face higher costs.

In most cases, as indicated by the experts committee, capital expenditure on pollution reduction through process change can be at least partially recovered through resulting savings in operating costs.

Enforcement

The pulp and paper sector effluent limits regulation, as with all sectors under MISA, will be issued under Section 136 of the *Environmental Protection Act*. Penalties for non-compliance can be severe.

Convicted violators of regulations and orders made under the Act face fines of up to $50,000 for corporations and $5,000 for individuals per day for each offence on first conviction. For a subsequent conviction, a corporation can be fined $100,000 per day and individuals can be fined $15,000 per day.

In cases where damage to the environment is caused, corporations face fines on first conviction of up to $250,000 per day for each offence and on a subsequent conviction of up to $500,000 per day. Individuals, for a first conviction, face fines of up to $10,000 per day with a fine of up to $25,000 per day for a subsequent conviction for each offence, plus a year in jail.

Directors and officers of a corporation are liable for the activities of their corporation that may result in damage to the environment.

MOE reviewing public comments on sewer use control

In September 1988, the Ministry of the Environment released a discussion paper that outlined a program to reduce the toxic discharges from thousands of industries to municipal sewer systems. A public review period on the discussion paper entitled *Controlling Industrial Discharges to Sewers* has been completed. The ministry is now considering public comments and developing its final position.

Responses to the discussion paper generally support the ministry's position to impose controls at the source. Some concerns were raised regarding the enforcement and costs of the program.

As part of the review process, the ministry conducted 15 workshops across the province. These workshops provided an opportunity for municipal, industrial and business representatives to examine the proposed program in detail with ministry staff. In addition, written submissions were received from the MISA advisory committee, environmental interest groups, industrial companies, industrial associations, business associations and other government agencies. The ministry will publish a report containing the public's comments and suggestions, and the ministry's response to them.

MISA sewer use control program

The proposed program calls for thousands of industries to reduce drastically toxic contaminants from their liquid wastes before discharging to municipal sewer systems. This would complement the MISA direct discharge component.

The ministry proposes a sewer use control program that will implement discharge limits regulations on 22 industrial sectors across the province. To meet these limits, industries must reduce their toxic discharges to levels that can be obtained using the best available technology that is economically achievable (BATEA). Industries will be free to choose how they meet the discharge limits. For example, they may wish to reduce or recycle their toxic wastes, change production processes, substitute raw materials or use pre-treatment technology.

Industries not covered under an industrial sector BATEA discharge limit, and industries which discharge significant quantities of conventional pollutants, would have to meet local limits designed to protect the receiving environment or the treatment process of the local sewage treatment plant.

Enforcement of these discharge limits will be shared by the ministry and the municipalities. As the first line of enforcement, municipalities will be responsible for developing and implementing a sewer use control plan that incorporates all the provincial requirements including enforcement. The plan will be subject to ministry approval. Once the plan is approved and implemented, the ministry will continue to audit industries' compliance with the discharge limits and the municipalities' enforcement of the program. Both industries and municipalities could be subject to prosecution if discharge limits are exceeded.

Currently, each municipality is responsible for developing and enforcing its own sewer use by-laws. Under the existing system requirements vary from municipality to municipality, but even the most stringent ones fail to adequately control the discharge of toxic contaminants.

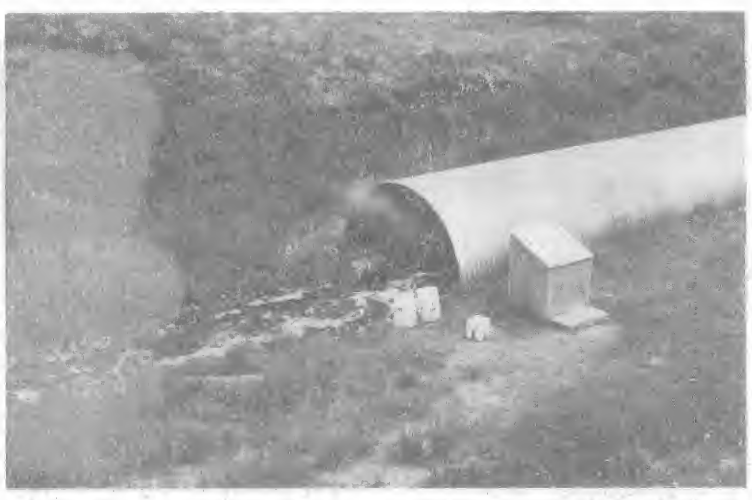
Sewage treatment plants are not designed to treat these contaminants. As a result, some toxic pollutants, unless they are prevented from entering the sewer system, will continue to pass through into the natural waterways, contaminate sewage sludge, threaten sewage treatment plant workers' health and interfere with the sewage treatment plant operations.

Under the MISA program, discharge limits will be placed on effluent from sewage treatment plants. It will be the responsibility of sewage treatment plant owners to ensure the limits are met. The development and enforcement of the ministry's sewer use control program will help sewage treatment plants meet the MISA discharge limits.

As an interim measure, while the sewer use program is being developed and implemented, ministry staff have been working with municipalities to strengthen existing sewer use by-laws and gather data on industries using their sewer systems.

Training courses have been prepared for those who will be involved in the monitoring and enforcement of the program. They will be offered at community colleges starting in the fall of 1989.

A two-day workshop will also be held at the University of Toronto's Institute for Environmental Studies in September.



Monitoring of effluent will be required under the interim control program for kraft mills, and also by the MISA monitoring regulation for the pulp and paper sector. A kraft mill discharge pipe, above, is being monitored for flow rates.

September symposium planned on MISA and the municipalities

The University of Toronto's Institute for Environmental Studies will be holding a two-day symposium, September 11-12 in Toronto, on the role of the municipalities in implementing the MISA municipal regulation and sewer use control program.

The symposium will assist elected officials and municipal staff to understand the requirements of MISA and the role they will play in implementing and enforcing sewer use control by-laws.

The registration fee for the conference will be $295

For more information please write Dr. Marianne B. Scott, MCC Systems Canada Inc., 30 Wellington Street East, Suite #202, Toronto, Ontario M5E 1S3 or call 416-368-2959

UPCOMING MISA EVENTS

AUGUST 1989

- Promulgation of the effluent monitoring regulation for the mining sector.
- Release of the draft effluent monitoring regulation for the electric power generation sector. There will be a 30-day public review period.

A copy of the draft regulation may be obtained from Environment Ontario's Public Information Centre at 416-323-4321.

SEPTEMBER 1989

- Release of the draft effluent monitoring regulation for the industrial mineral sector. There will be a 30-day public review period.

A copy of the draft regulation may be obtained from the Public Information Centre at 416-323-4321.

- Promulgation of the effluent monitoring regulation for the metal casting direct discharge sector.
- September 11-12, 1989–'The Municipalities' Role in MISA: A Two-Day Symposium on the Municipal-Industrial Strategy for Abatement of Pollutants in Ontario's Waterways', the Skyline Hotel, Toronto. Sponsored by the University of Toronto's Institute for Environmental Studies and Environment Ontario. Registration fee $295. For more information call Marianne Scott, 416-368-2959.
- September 17-22, 1989 – 'Dioxin '89 - 9th International Symposium on Chlorinated Dioxins and Related Compounds'. Chlorinated dioxins, dibenzofurans and other related organics continue to remain in the forefront of public, scientific and regulatory interest. The symposium will allow scientists to exchange the latest technical advances with their peers. Environment Ontario is a sponsor. The symposium will be held at the Hilton International Hotel, Toronto, Ontario. Full registration $500 after June 5, 1989. For more information call 416-860-1772.

OCTOBER 1989

- Promulgation of the effluent monitoring regulation for the electric power generation sector
- Promulgation of the effluent monitoring regulation for the industrial mineral sector

INSIGHT

MISA reaches turning point

by Jim Bradley
Minister of the Environment

The Municipal Industrial Strategy for Abatement has reached a major turning point with two recent events.

With the release of the monitoring regulations for the petroleum refining, organic chemical manufacturing, iron and steel, inorganic chemicals, pulp and paper and mining sectors, MISA has passed beyond strategy development and planning and entered into its true purpose as an action program to reduce pollution.

The Ministry of the Environment has a mandate to ensure that MISA is implemented, that it is enforced, and that it produces the results for which it was designed.

Ministry funding for the MISA program has been increased by $8.3 million to a new total of $20.9 million this year and program staff will increase by 77 to 244.

Under MISA, industries will no longer be able to avoid their responsibility for the toxic contaminants they discharge into Ontario's waterways. The true cost of handling, treating or eliminating those wastes are being directed back to the source of the problem instead of being imposed on the community at large.

The first fruit of the MISA approach is the petroleum refining sector monitoring regulation which was issued in the summer of 1988. The monitoring requirements for petroleum refineries will be completed by the end of 1989. Three other sectors, organic chemical manufacturing, iron and steel and inorganic chemicals will begin monitoring later this year. The remaining sectors will begin monitoring in 1990.

Jim Bradley,
Minister of the Environment

While MISA is good news for the environment, it is both an immediate opportunity and a long-term insurance policy for industry. In some sectors, the cleanup required by MISA provides opportunities for forward-looking enterprises to improve productivity as waste production is cut, and to create marketable clean new processes. Meanwhile, MISA safeguards clean water, the very basis of civilization and industrial development.

The discussion paper released last fall, *Controlling Industrial Discharges to Sewers* outlines the direction the ministry will be taking in cleaning up the thousands of industrial discharges now being discharged into the municipal sewer systems.

This discussion paper presents a clear sense of direction for municipalities. To provide an interim measure of control, we have released the model sewer use by-law, a tool which they can use to start developing action and abatement programs in their own communities. There is nothing to prevent a municipality from starting now to establish the information base and organization which MISA's municipal strategy will require of them.

The end result, from action at the municipal and provincial levels, will be a healthier, cleaner environment with a more equitable distribution of the costs this cleanup entails.

Iron and steel sector monitoring regulation promulgated

Ontario's seven iron and steel producers must monitor the wastewaters they discharge to rivers and lakes for up to 152 contaminants.

These seven plants are located along lake Ontario between Hamilton Harbour and Whitby, along the St. Mary's river, along the Ottawa River, in the Niagara area and along Lake Erie near Nanticoke.

The effluent monitoring regulation for the iron and steel sector was promulgated on the 29th of May, following a public review period.

Companies in this sector have five months to comply with the regulation. Monitoring is to begin November 1, 1989. This lead-in time will allow the companies to purchase and install required equipment to arrange for laboratory services and to train personnel.

The monitoring approach

For the purpose of monitoring, the iron and steel industry was divided into integrated iron and steel mills (four plants), specialty steel producers and mini mills (three plants). Integrated mills include coke-making and iron-making processes which generate most of the industry's priority pollutants. Specialty steel producers and mini mills generally melt scrap metal to produce low carbon steel and specialty steel products.

Final discharges to waterways will be monitored daily for four contaminants, three times a week for 12 contaminants, weekly for eight to 12 contaminants, monthly for 86 (the three smaller operations) or 117 contaminants (for the four large mills), and quarterly for 140 (small mills) or 152 pollutants (large mills). Other waste streams such as cooling water, waste disposal site and storage site will also be monitored. Biological monitoring will provide an additional screening mechanism that will complement chemical analysis of toxic substances. Monthly effluent toxicity tests using rainbow trout and Daphnia magna will be conducted.

Effluent samples taken from each plant will be analysed in accordance with quality assurance/quality control standards specified in the regulation. The ministry will audit the sampling and analysis to assure the results are accurate and representative.

Economic considerations

The ministry has produced a report which assesses the economic environment of the iron and steel sector and analyses the financial implications of the monitoring costs.

The report is entitled *Economic Implications of the MISA Monitoring Regulations on Ontario's Iron and Steel Sector: Final Report*. Highlights of the report are summarised below.

- About 34,000 people are employed by the iron and steel sector companies.
- Cost of monitoring will be borne by the industry.
- Incremental capital and monitoring costs for the iron and steel sector will be about $8.4 million ($3.3 million for operating costs and $5.1 million for capital costs).
- The monitoring requirements will not have an adverse effect on employment levels.
- Plants will not suffer undue financial burden from the monitoring costs.

MAC plays vital role in MISA program

The MISA Advisory Committee (MAC) of independent environmental experts has been involved with the MISA program ever since it was established by an Order-in-Council, in November 1986.

Committee members were appointed to MAC by the Minister of the Environment on the basis of their knowledge, concern and expertise in environmental issues.

The group has met 48 times since November, 1986 to review and advise on the progress of the MISA program and the adequacy of the draft regulations.

MAC has also reviewed and commented on the *Kraft Mill Effluents* in Ontario report which was the basis for the recently announced strategy for kraft mill pollution reduction.

MAC has also provided comments on the discussion paper *Controlling Industrial Discharges to Sewers*, and will actively participate in developing the MISA municipal regulations and sewer use control program.

Two new members, Joanna Kidd (formerly of Pollution Probe) and Paul Muldoon (Canadian Institute for Environmental Law and Policy), were recently appointed to the committee. James MacLaren (consulting engineer) is the chairperson. Dr. Isobel Heathcote (University of Toronto) and Kai Millyard (Friends of the Earth) were recently appointed vice-chairpersons.

Harvey Clare (industrial executive), Dr. Paul Hebert (University of Windsor), and Dr. Don Mackay (University of Toronto) complete the membership.

The MAC annual report is available to interested parties on request.

For more information please call Doug Vallery, the co-ordinator of MAC, at 965-1400.

MISA UPDATE

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Kraft mill pollution reduction strategy implemented

Ontario's nine kraft mills must reduce the flow of toxic chemicals currently being discharged into the province's rivers and lakes by the end of 1991, as the result of a program announced in April by Environment Minister, Jim Bradley. The ministry has also alerted these mills that subsequent discharge limits, imposed under the MISA program, will require further pollution reductions.

The nine kraft mills operating in Ontario discharge nearly a million cubic metres of effluent each day – a volume equal to the sewage produced by a population of two million people.

These mills are distinct from others in the pulp and paper sector by their use of chlorine to bleach the pulp. In the process the chlorine combines with the dissolved organic matter from wood fibres, and can form persistent and acutely toxic compounds that bioaccumulate and bioconcentrate.

It is estimated that mills currently discharge 150 to 200 tonnes of these chlorinated compounds each day. As well, the effluents from eight of nine mills have been found to be acutely toxic to fish. Studies have shown that five of the seven mills surveyed had traces of the most toxic form of dioxins – 2,3,7,8-TCDD.

To reduce this level of pollution, the ministry has developed a control strategy calling for immediate abatement between now and 1991 followed by more comprehensive pollution control measures under MISA between 1991 and 1993. This strategy was developed after careful consideration of a study on kraft mill operations conducted by an independent body of experts.

Immediate abatement action

Based on the experts' findings that proven and practical technology exists, the ministry will seek the maximum pollution reductions that can be attained from each mill over the next two years. Plans are underway for control orders to be issued in the fall of 1989 requiring mills to reduce their discharge of chlorinated organic compounds to no more than 2.5 kilogram per air dried tonne of kraft pulp.

In addition, mills will be required to reduce, immediately after the orders become enforceable, biochemical oxygen demand (BOD) and suspended solid discharges.

The mills will also be required to monitor their effluents and report to the ministry during this two year control period.

Controls under MISA

While these interim controls will immediately reduce discharges, significantly lower limits are being developed under the MISA program.

Under MISA, kraft mills will be required to meet discharge limits attainable using the best available technology economically achievable (BATEA). As well, mill effluent must be non-lethal to fish.

The ministry will develop BATEA limits with the participation of the joint technical committee for the pulp and paper sector and the MISA advisory committee of independent environmental specialists. Together, they will review the data gathered during the 12-month monitoring program that all pulp and paper mills will begin in January 1990. The results from ministry studies of chlorinated organic compounds will also be considered.

The BATEA limits that are determined will then be disseminated for public review. Subsequently, a limits regulation will be promulgated in 1991. Mills must be in compliance with the regulation by 1993.

Under both the regulation and the interim controls, kraft mills will be free to choose how they achieve their discharge limits. The options include manufacturing process changes, substitution of chemicals, recycling of waste byproducts, and end-of-pipe treatment. The experts committee identified four pollution abatement technologies which are proven, practicable and economically achievable.

The first, a process change called oxygen delignification, uses oxygen to remove organic matter, thus reducing the amount of chlorine required. A second process, known as high chlorine substitution, replaces chlorine with chlorine dioxide, resulting in a less toxic waste byproduct.

A third process change – extended delignification – provides more 'cooking' time for the wood chips. This again removes more organic matter so less chlorine bleaching is required later in the process. Finally, the experts identified biological treatment as an end-of-pipe approach. The organic material in the effluent can be converted by biological treatment into water, carbon dioxide and organic sediments.

The first three options offer opportunities for increased production efficiency and reducing the volume of toxic waste. The ministry encourages kraft mills to move in this direction.

Economic considerations

Economic factors were considered during the development of the pollution reduction strategy for this industry. The ministry assessed the impact of the requirements it will be establishing and has determined that Ontario's kraft mills can achieve the limits called for, in most cases, without financial difficulty.

Included in the ministry's consideration was the important economic contribution made by the pulp and paper industry in smaller towns. The livelihoods of many of these towns depends on the existence of a kraft mill.

The ministry also took into account that Ontario's mills

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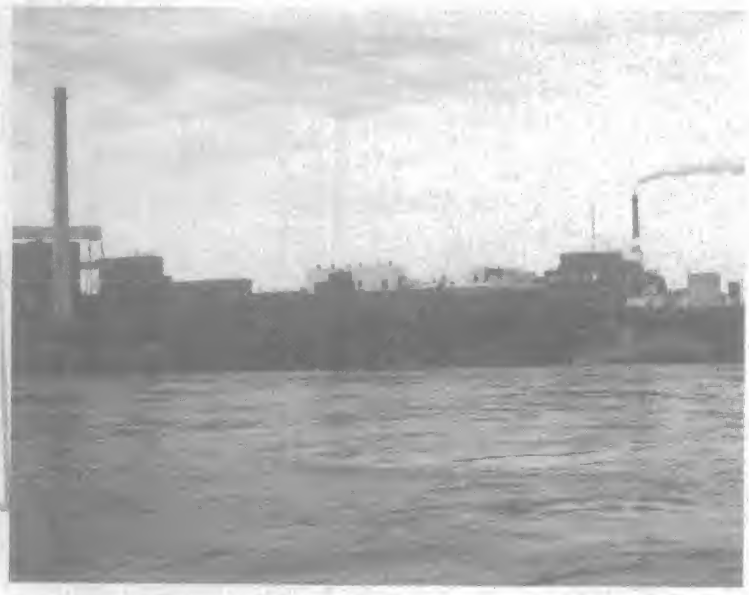

Kraft mills, such as the one pictured above, must reduce their toxic and conventional contaminants as a result of MOE's recently announced pollution reduction strategy

STOPPING WATER POLLUTION AT ITS SOURCE

MISA

Municipal/Industrial Strategy for Abatement

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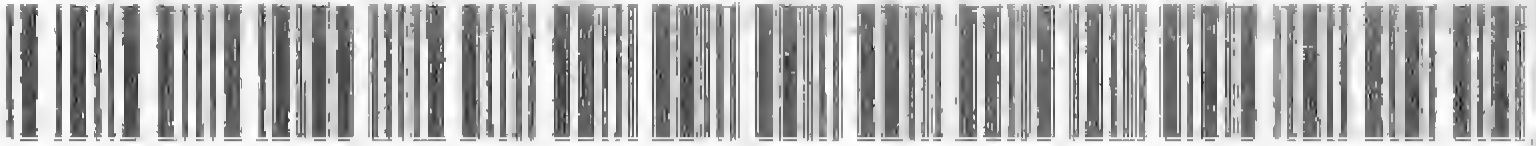
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